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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/686,841      | 10/16/2003  | Robert W. Lamberton  | I69.12-0613         | 8492             |

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MINNEAPOLIS, MN 55415-1002

EXAMINER

BERNATZ, KEVIN M

ART UNIT PAPER NUMBER

1773

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |   |  |
|------------------------------|--------------------------------------|---|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/686,841 | <b>Applicant(s)</b><br>LAMBERTON ET AL. |  |
|                              | <b>Examiner</b><br>Kevin M Bernatz   | <b>Art Unit</b><br>1773                 |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br/>           Paper No(s)/Mail Date <u>10/16/03+11/10/03</u>.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)<br/>           Paper No(s)/Mail Date. ____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</p> <p>6) <input type="checkbox"/> Other: ____.</p> |
|---|---|

## **DETAILED ACTION**

### ***Oath/Declaration***

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: It was not executed in accordance with either 37 CFR 1.66 or 1.68. Specifically, the Examiner notes that when two or more oaths or declarations are used to satisfy the signatory requirements of multiple inventors, all copies of the filed oaths or declarations must be identical. In the instant case, the faxed declaration submitted in addition to the declaration signed by Mr. Macken contains a different inventive entity (i.e. the faxed declaration does not include Mr. Macken as an inventor). It appears that applicants inadvertently forgot to include faxed page 3 of 5 with the supplemental oath or declaration. Submission of faxed page 3 of 5, should it include the listing of Mr. Macken as part of the inventive entity, or resubmission of a properly executed supplemental oath or declaration is required.

### ***Specification***

2. The abstract of the disclosure is objected to because applicants must remove the document ID from the bottom of the Abstract (i.e. "G:\MurphyA\...App.STL11531.doc"). Correction is required. See MPEP § 608.01(b).

### ***Examiner's Comments***

3. Regarding the limitation(s) "nanophase" in claims 1 - 23, the Examiner has given the term(s) the broadest reasonable interpretation(s) consistent with the written description in applicants' specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir.

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1997); *In re Donaldson Co., Inc.*, 16 F.3d 1190, 1192-95, 29 USPQ2d 1845, 1848-50 (Fed. Cir. 1994). See MPEP 2111. Specifically, "nanophase" is interpreted to merely require some structural element of a nanometer-scale (i.e.  $\leq 100$  nm), including, but not limited to, crystal grain sizes and/or particle sizes.

4. Regarding the limitation(s) "nanoclusters", the Examiner has given the term(s) the broadest reasonable interpretation(s) consistent with the written description in applicants' specification as it would be interpreted by one of ordinary skill in the art. Specifically, the Examiner has interpreted the above limitation to require greater than one nanometer-scale element, such as 1+ nanometer-scale grains or particles in the entire film.

5. Regarding the limitation(s) "nano-laminated", the Examiner has given the term(s) the broadest reasonable interpretation(s) consistent with the written description in applicants' specification as it would be interpreted by one of ordinary skill in the art. Specifically, the Examiner has interpreted the above limitation to require that the nanophase high magnetic moment material be present in a laminated film comprising 1+ nanometer-scale elements.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1 – 23 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a magnetic saturation moment of greater than 2.4 T (*page 7*), does not reasonably provide enablement for a “high magnetic moment”.

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. The Examiner notes that applicants have provided no guidance as to whether the term “magnetic moment” is synonymous with “magnetic saturation moment” or what range of values is entailed by “high”, since 2.4 T is merely listed as a preferred embodiment.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1 – 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. The term “high” in claims 1 and 14 is a relative term which renders the claims indefinite. The term “high” is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the

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art would not be reasonably apprised of the scope of the invention. The Examiner notes that the disclosure of a *preferred* range of greater than 2.4 T for the magnetic *saturation* moment is not sufficient to define the term "high". For purposes of evaluating the prior art, the Examiner has interpreted that any soft magnetic material will meet the claimed limitation of a "high" magnetic moment.

11. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "magnetic write element" in claim 1 is used by the claim to mean an element (i.e. magnetic head/sensor/device) capable of writing a magnetic field, while claim 13 appears to then recite that the "write element" is part of a magnetic recording medium. This redefining of the term "write element" in claim 13 is indefinite because the specification does not clearly redefine the term and one of ordinary skill in the art would not equate a "write element" as part of a soft magnetic/keeper underlayer in a perpendicular magnetic recording film.

12. Claim 16 recites the limitation "the coated nanoclusters" in lines 1 - 2. There is insufficient antecedent basis for this limitation in the claim. For purposes of evaluating the prior art, the Examiner has taken claim 16 to depend from claim 15.

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13. Claims 22 and 23 recite the limitation "wherein the matrix" in line 1. There is insufficient antecedent basis for this limitation in the claim. For purposes of evaluating the prior art, the Examiner has taken claims 22 and 23 to depend from claim 20.

***Claim Rejections - 35 USC § 102***

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

15. Claims 1 – 8, 11 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Funayama et al. (U.S. Patent App. No. 2003/0197982 A1).

Regarding claims 1, 6 and 12, Funayama et al. disclose a magnetic write element (*Title*) comprising a nanophase high magnetic moment material (*Abstract and Paragraph 0078*).

Regarding claims 2 and 3, Funayama et al. disclose nanocrystals (i.e. applicants' "nanoclusters") that are coated (*Paragraphs 0078 – 0079 – insulating matrix*) and comprise materials meeting applicants' claimed limitations (*ibid*).

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Regarding the limitation(s) in claims 4 and 5, the Examiner notes that these limitation(s) are/(is a) process limitation(s) and is/are not further limiting in terms of the structure resulting from the claimed process. Specifically, in a product claim, as long as the prior art product meets the claimed structural limitations, the method by which the product is formed is not germane to the determination of patentability of the product unless an unobvious difference can be shown to result from the claimed process limitations. In the instant case, as long as the final magnetic nanoclusters are coated, the claimed product is necessarily met since the structure of the final resulting disclosed and claimed product are deemed to be identical. As noted above, Funayama et al. disclose coating the particles in an inorganic matrix (*Paragraphs 0078 – 0079*).

Regarding claims 7, 8 and 11, Funayama et al. disclose that the element can comprise multiple laminates of the granular “nanophase high magnetic moment material” separated by a non-magnetic matrix (*Figures 16 and 17*).

### ***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 14 – 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Funayama et al. as applied above, and further in view of Lam (U.S. Patent App. No. 2003/0021050 A1).



Funayama et al. is relied upon as described above.

Regarding claim 14, Funayama et al. fail to disclose the structural limitations recited in base claim 14.

However, Lam teaches that it is known in the art to form magnetic heads comprising applicants' claimed structure (*Figures 1 –3 and 14 and Paragraphs 0007, 0010 and 0056*), wherein the magnetic pole portions can be formed of the beneficial soft magnetic materials taught by Funayama et al., since Funayama et al. teaches that such materials possess excellent soft magnetic properties, high resistance and reduced Barkhausen noise (*Paragraphs 0036 – 0042*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Funayama et al. to make a magnetic element meeting applicants' claimed structure as taught by Lam, since Lam teaches that such a structure is old in the art and the use of the beneficial soft magnetic materials taught by Funayama et al. would lead to a magnetic pole portion exhibiting improved performance, since excellent soft magnetic properties, high resistance and reduced Barkhausen noise is desired in these materials.

Regarding claims 15 – 21, these limitations are met for substantially the identical reasons as recited above with regard to claims 1 – 8.

18. Claims 1 – 6, 12 and 14 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lam ('050 A1) in view of Zhang et al. (U.S. Patent App. No. 2003/0129405 A1).

Regarding claims 1, 6, 12, 14 and 19, Lam discloses a transducer head/write element meeting applicants' claimed structural limitations (*Figures 1 – 3 and 14 and Paragraphs 0007, 0010 and 0056*).

Lam fails to disclose using a "nanophase high magnetic moment material" as part of the top and bottom poles (i.e. as the pole tips), though the Examiner notes that Lam explicitly teaches that the pole tips are desired to possess good high frequency properties in order to write at a high data rate (*Paragraphs 0007, 0010 and 0056*).

However, Zhang et al. teach a high magnetic moment nanophase material wherein the material is explicitly taught to possess excellent soft magnetic properties, including excellent high frequency performance (*Paragraphs 0032 – 0034 and 0073 – 0088*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Lam to use a high magnetic moment nanophase material as taught by Zhang et al. as the pole tips, thereby meeting applicants' claimed structural limitations, since such materials possess excellent soft magnetic properties, including excellent high frequency performance.

Regarding claims 2, 3, 15 and 16, Zhang et al. disclose nanocrystals (i.e. applicants' "nanoclusters") that are coated (*Paragraphs 0034 and 0047*) and comprise materials meeting applicants' claimed limitations (*Paragraph 0033*).

Regarding the limitation(s) in claims 4, 5, 17 and 18, the Examiner notes that these limitation(s) are/(is a) process limitation(s) and is/are not further limiting in terms of the structure resulting from the claimed process. Specifically, in a product claim, as long as the prior art product meets the claimed structural limitations, the method by which the product is formed is not germane to the determination of patentability of the product unless an unobvious difference can be shown to result from the claimed process limitations. In the instant case, as long as the final magnetic nanoclusters are coated, the claimed product is necessarily met since the structure of the final resulting disclosed and claimed product are deemed to be identical. As noted above, Zhang et al. disclose using coated particles (*Paragraphs 0034 and 0047*).

19. Claims 7 – 11 and 20 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lam in view of Zhang et al. as applied above, and further in view of Sun et al. (U.S. Patent App. No. 2004/0134565 A1).

Lam and Zhang et al. are relied upon as described above.

Regarding claims 7, 11 and 20, neither Lam nor Zhang et al. disclose using a laminate structure meeting applicants' claimed limitations.

However, Sun et al. teach that one can form the nanophase material by coating a magnetic core with a matrix material in order to tailor the overall magnetic properties of the structure to the desired end use (*Paragraphs 0061 – 0066*). The Examiner notes that the materials of both Zhang et al. and Sun et al. possess nanometer size ranges and are disclosed as magnetic core materials surrounded by a magnetic or non-

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magnetic coating. Should thickness values greater than the disclosed thickness of the particles/magnetic grains be desired, multiple layers must be deposited. Such a structure would necessarily result in layers of nanoclusters of high magnetic moment material separated by approximately alternating matrix layers.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Lam in view of Zhang et al. to use a laminated structure meeting applicants' claimed limitations as taught by Sun et al., since such a structure would allow for the formation of nanophase high magnetic moment layers of thickness values greater than the size of the individual coated particles.

Regarding claims 8 – 10 and 21 – 23, Sun et al. disclose materials meeting applicants' claimed limitations as the core and/or matrix (*Paragraphs 0062 – 0066*). The Examiner notes that "vacuum-deposited" in claims 9 and 22 is a process limitation in a product claim and is not germane to the determination of patentability of the claimed *product* for the reasons recited above with regard to claims 4, 5, 17 and 18.

### ***Conclusion***

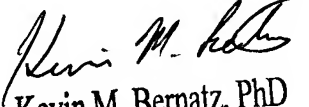
20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB  
March 6, 2005

  
Kevin M. Bernatz, PhD  
Primary Examiner